Volunteer Lake Assessment Program Individual Lake Reports

PILLSBURY LAKE, WEBSTER, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	5,554	**Max. Depth (m):**	3	**Flushing Rate (yr^{-1}):**	36.8
Surface Area (Ac.):	45	**Mean Depth (m):**	1.4	**P Retention Coef:**	0.35
Shore Length (m):	5,420	**Volume (m^3):**	263,500	**Elevation (ft):**	415

TROPHIC CLASSIFICATION

Year	Trophic class
1979	EUTROPHIC
1998	EUTROPHIC

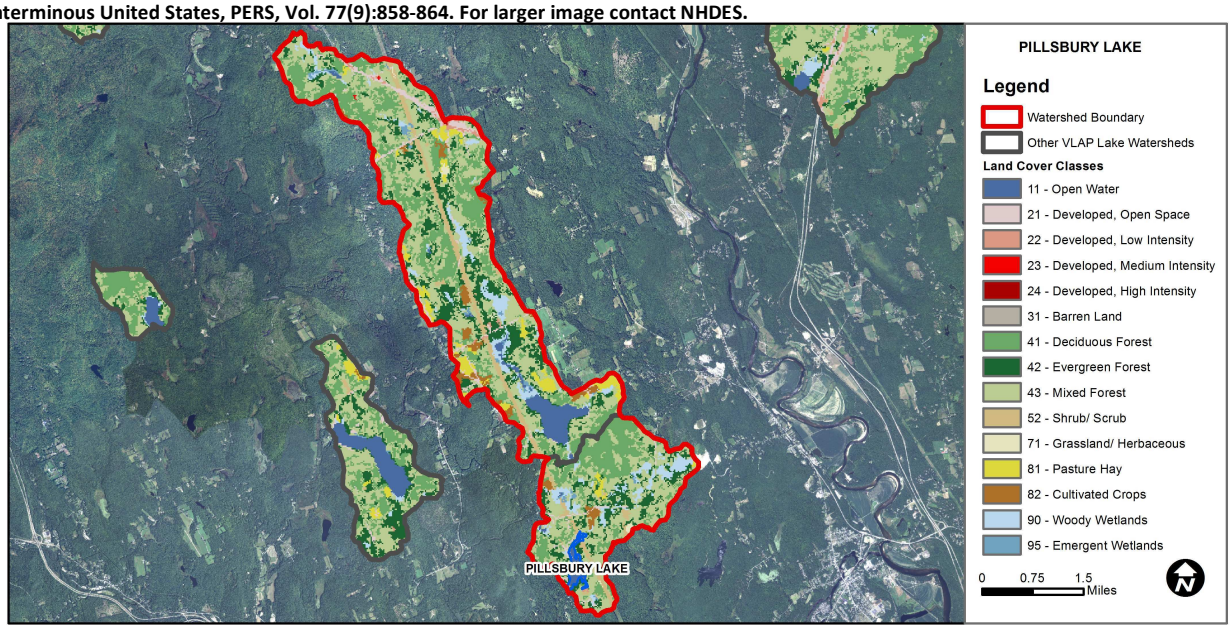
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Encouraging	The calculated median is fewer than 5 samples and is < indicator and the chlorophyll a indicator is okay. More data needed.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Chlorophyll-a	Encouraging	The calculated median is fewer than 5 samples and is < indicator. More data needed.
Primary Contact Recreation	Escherichia coli	Encouraging	There are no geometric means or there are > 2 single samples but those samples are within 75% of the geometric means criteria. More data needed.
	Chlorophyll-a	Encouraging	There are < 10 samples with 0 exceedances of indicator. More data needed.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	3.56	Barren Land	0	Grassland/Herbaceous	0.35
Developed-Open Space	2.92	Deciduous Forest	23.54	Pasture Hay	3.64
Developed-Low Intensity	0.65	Evergreen Forest	15.04	Cultivated Crops	2.38
Developed-Medium Intensity	0.06	Mixed Forest	37.03	Woody Wetlands	5.66
Developed-High Intensity	0.01	Shrub-Scrub	4.43	Emergent Wetlands	0.73

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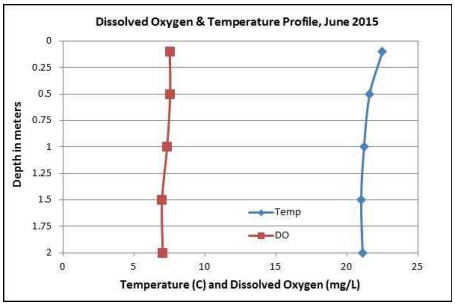
Pillsbury Lake, Webster

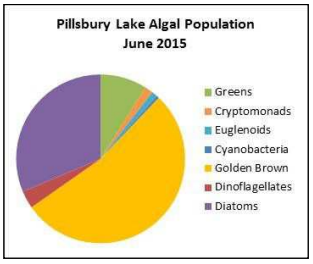
2015 Data Summary

Recommended Actions: Conductivity and chloride levels were highest at stations located near roadways which likely indicates the influence of road salt on conductivity and chloride levels. Encourage road agents and winter maintenance companies to obtain a Voluntary NH Salt Applicator license through the UNH Technology Transfer Center's Green SnowPro Certification program. Drainage areas were sampled following a significant storm event in April. Bog phosphorus and turbidity levels were greatly elevated. Drainage #1 and #3 phosphorus and turbidity were slightly elevated to elevated and Drainage #6 phosphorus was elevated. Stormwater runoff negatively impacts these stations and carries phosphorus and sediment laden water to the lake. Efforts should be made to identify sources of phosphorus and erosion in the sub-watersheds and areas where stormwater management projects could be effective in reducing stormwater runoff to these stations. DES' "NH Homeowner's Guide to Stormwater Management" is a great resource for lake communities. Keep up the great work!

Observations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels were elevated in June and decreased to low levels in August. Average transparency increased from 2014, was slightly elevated and greater than the state median. Visual inspection of historical data indicates slightly variable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Epilimnetic (upper water layer), Deer Meadow Bk. and Outlet conductivity levels were slightly elevated in June but decreased to average levels in August and were slightly greater than the state median. Bog, Drainage #1 and Drainage #6 conductivity and chloride levels were low to average in April. Drainage #2 and #3 conductivity and chloride levels were slightly greater than the state medians but chloride levels were much less than the state chronic chloride standard.
- **E. coli:** Bog E. coli levels were very low and much less than the state standard of 406 cts/100 mL.
- **Total Phosphorus:** Epilimnetic phosphorus decreased slightly from June to August, was slightly greater than the state median and was within an average range for that station. Visual inspection of historical data indicates slightly variable epilimnetic phosphorus between years. Deer Meadow Bk. phosphorus levels decreased from June to August and were within an average range. Outlet phosphorus levels were average in June and increased to elevated levels in August, potentially due to low water levels. Bog phosphorus levels were greatly elevated and the turbidity of the sample was also greatly elevated following a significant storm event. The sample contained organic matter and was highly colored indicating an area rich in organic content that can contribute to elevated phosphorus, turbidity and color, and low pH. Drainage #1 and #6 phosphorus levels were elevated following the storm event and turbidity was also elevated in the #1 sample. Drainage #2 and #3 phosphorus levels were low and average.
- **Transparency:** Transparency was low (poor) in June due to the elevated algal growth and then improved in August. Average transparency decreased from 2014 and visual inspection of historical data indicates relatively stable transparency since monitoring began.
- **Turbidity:** Epilimnetic turbidity was elevated in June likely due to the elevated algal growth, and then decreased to average levels in August. Deer Meadow Bk. turbidity was low in June and increased to slightly elevated levels in August likely due to low flow conditions. Outlet turbidity was slightly elevated on both sampling events. Bog and Drainage #1 turbidities were elevated in April following a significant storm event. Organic matter was noted in the Bog sample and sediment was noted in the Drainage #1 sample. Drainage #3 turbidity was slightly elevated for that station and #2 and #6 turbidities were low.
- **pH:** Epilimnetic, Deer Meadow Bk. and Outlet pH levels were within the desirable range 6.5-8.0 units. Bog and Drainage pH levels were less than desirable and indicative of areas rich in organic acids due to decomposing plant matter.





NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Table 1. 2015 Average Water Quality Data for PILLSBURY LAKE

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	9.8	7.03	13	77.8		17	1.44	1.85	2.53	6.61
Bog			3	20.0	10	598			24.70	5.02
Deer Meadow Bk.				84.3		23			1.19	6.54
Drainage #1			6	51.0		46			13.80	6.13
Drainage #2			14	84.3		8			0.84	6.23
Drainage #3			22	115.1		24			3.42	5.75
Drainage #6			5	34.5		35			1.04	5.65
Outlet				75.1		25			2.61	6.70

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	N/A	Ten consecutive years of data necessary for analysis.	Chlorophyll-a	N/A	Ten consecutive years of data necessary for analysis.
pH (epilimnion)	N/A	Ten consecutive years of data necessary for analysis.	Transparency	N/A	Ten consecutive years of data necessary for analysis.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary for analysis.